Space Weather Forecast

Issued on Thursday, 07 July 2022 at 13:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1/Minor Geomagnetic Storms likely Day 1 (07 July), with risk decreasing through the period. Slight chance of R1-R2 Minor-Moderate radio blackouts.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity remains Low with only minor Common-class flares observed. There are currently six sunspot regions on the visible disc, with the most complex being a region in the northeast quadrant. The remaining sunspots appear to be relatively small and stable. The larger Common-class flare early on 5 July produced a Coronal Mass Ejection (CME) which may give a glancing blow at Earth on July 8th, although confidence is low. No other Earth-directed CMEs have been observed in available imagery over the past 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind has shown a weak CME arrival, starting around 07/0600 UTC, perhaps combined with the onset of a coronal hole fast wind. Wind speed was slow between 300-330 km/s, but saw a step-wise increase from 07/0600 UTC and is now just above 400 km/s. The Interplanetary Magnetic Field was weak, but jumped briefly to moderate levels around 07/0810 UTC, before becoming strong at 07/1045 UTC. The north-south component varied weakly, but started to vary more strongly after 07/1100 UTC. Geomagnetic activity was Quiet (Kp 0-2), with an Unsettled (Kp 3) interval 07/0900-1200 UTC.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is likely to remain Low, with a Slight Chance of isolated Moderate-class flares. An increase is possible through the period as returning regions potentially rotate onto the eastern limb.

Solar Wind / Geomagnetic Activity: Earth may experience a glancing blow from a CME which left the Sun on 05 July. This CME was difficult to assess but it gave a faint partial halo in SOHO imagery and as such a low confidence glancing blow is possible on Day 2 (08 July). Otherwise it appears that Earth has recently experienced a weak CME arrival, combined with the onset of a fast wind from a coronal hole. Slightly elevated or perhaps elevated wind speeds could last through to Day 3 (09 July).
Geomagnetic activity is expected to be Unsettled to Active with G1/Minor Storm intervals likely on Day 1 (07 July) due to combined HSS and CME effects. Activity should decline through Day 3 to be mainly Quiet on Day 4 (10 July).

Energetic Particles / Solar Radiation: No solar radiation storms are likely, although probabilities increase very slightly as the largest sunspot region moves towards centre disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	60	30	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	20	20	20
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	2
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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